

that a further fee is due, authorization is hereby given to charge any such fee to our Deposit Account No. 01-0268.

REMARKS

To place this application in better condition for complete action on the merits, the specification has been suitably revised to correct informalities and to bring it in better conformance with U.S. practice. Proposed drawing revisions have been submitted in Fig. 1, and a new, more descriptive abstract has been substituted for the original abstract.

Original claims 1-15 and 16/13 have been amended in formal respects to improve the wording thereof. Original claims 16/14 and 16/15 have been rewritten as new claims 17-18, respectively. New claims 19-20 have been added to provide a fuller scope of coverage. Adequate support for the subject matter recited in new claims 19-20 may be found in the specification as originally filed.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages i-xvii are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

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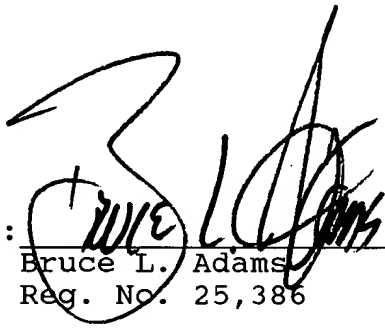
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Early and favorable action on the merits are most respectfully requested.

Respectfully submitted,

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MAILING CERTIFICATE

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AUGUST 9, 2001

Date

"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

IN THE SPECIFICATION:

After the title, before line 1 of page 1 has been amended as follows:

BACKGROUND OF THE INVENTION

Heading beginning at line 1 of page 1 has been amended as follows:

[TECHNICAL FIELD] FIELD OF THE INVENTION

Paragraph beginning at line 2 of page 1 has been amended as follows:

--The present invention relates to an information recording medium [that reproducing] from which information can be [made] reproduced by the utilization of near-field light, and to an information reproducing apparatus for reproducing information recorded with [density] on the information recording medium. [and, more] [particularly,] The present invention also relates to an information recording medium and to information reproducing apparatus [that] by which tracking control is made possible.--

Heading beginning at line 9 of page 8 has been amended as follows:

[DISCLOSURE OF THE INVENTION] SUMMARY OF THE INVENTION

Paragraph beginning at line 7 of page 23 has been amended as follows:

Figs. 8(a) and 8(b) show other examples [Fig. 8 is a figure showing another example] of the recorded bits of an information recording medium according to Embodiment 2.

Heading beginning at line 20 of page 23 has been amended as follows:

[BEST MODE FOR CARRYING OUT THE INVENTION] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Paragraph beginning at line 14 of page 41 has been amended as follows:

Incidentally, in Embodiment 2 explained above, the servo bits were formed in the servo pattern region of the information recording medium 3 such that its section is of a triangular groove. In place of this, as shown in [Fig. 8,] Figs. 8(a) and 8(b), grooves 50 and 51 may be formed stepwise in radial section of the information recording medium 3.

Heading beginning at line 8 of page 69 has been amended as follows:

[INDUSTRIAL APPLICABILITY]

IN THE CLAIMS:

Claims 1-16 have been amended as follows:

1. (Amended) [In an information recording medium forming, on a medium surface, information to be reproduced by a reproducing probe having a microscopic aperture for producing near-field light, the] An information recording medium [characterized in that] comprising:

a read-out track having a data region forming data bits for [reproduced-data zone recording] reproduced data and a servo pattern [zone recording servo data] region forming servo bits for tracking control, [are provided on a read-out track to be read by the reproducing probe;

as] the servo [data being arranged alternately] bits having a first groove [formed having a depth increased constantly or gradually in one] that is deep in a direction perpendicular to both a [direction] length of the read-out track and a [direction of a] depth of the information recording medium, and a second groove [formed having a depth increased constantly or gradually in the other direction

perpendicular to both the direction of the read-out track and the direction of the depth of the medium, on the read-out track in the servo pattern zone] that is deep in a direction opposite to the first groove and having a depth gradually increasing along the read-out track.

2. (Amended) An information recording medium as claimed in claim 1[, characterized in that]; wherein the first groove and the second groove are triangular in section taken in the direction perpendicular to the length of the read-out track.

3. (Amended) An information recording medium as claimed in claim 1; wherein[, characterized in that] the first groove and the second groove [are stepwise in section] have a stepped cross-section taken in the direction perpendicular to the length of the read-out track.

4. (Amended) [In an information recording medium forming, on a medium surface, information to be reproduced by a reproducing probe having a microscopic aperture for producing near-field light, the] An information recording medium [characterized in that] comprising:

a read-out track having a data region forming data bits for [reproduced-data zone recording] reproduced data and a servo pattern [zone recording servo data] region forming

servo bits for tracking control, [are provided on a read-out track to be read by the reproducing probe;

as] the servo bits having [data being arranged alternately] a first groove extending in a [formed having an interval in a direction of the read-out track increased constantly or gradually in one] direction perpendicular to both a length [the direction] of the read-out track and a [direction of a] depth of the information recording medium, and a second groove extending in a direction opposite to the first groove [formed having an interval in the direction of the read-out track increased constantly or gradually in the other direction perpendicular to both the direction of the read-out track and the direction of the depth of the medium, on the read-out track in the servo pattern zone].

5. (Amended) [In an information recording medium forming, on a medium surface, information to be reproduced by a reproducing probe having a microscopic aperture for producing near-field light, the] An information recording medium [characterized in that] comprising:

a read-out track containing a unit of [the] information [comprises] comprised of a groove [formed] having a depth which increases constantly or gradually [increased] in [one] a direction perpendicular to both a length [direction] of the [a] read-out track [to be read by the reproducing

probe] and a [direction of a] depth of the information recording medium.

6. (Amended) [In an information recording medium forming, on a medium surface, information to be reproduced by a reproducing probe having a microscopic aperture for producing near-field light, the] An information recording medium [characterized in that] comprising:

a read-out track having a groove containing a unit of information, the groove being saw tooth-shaped in a section taken in a direction perpendicular to a read-out direction, [to be read by the reproducing probe is formed in the form of saw tooth,] the unit of information being formed along a slant surface of the saw tooth-shaped groove [constituting the saw tooth].

7. (Amended) [In an information reproducing apparatus for reproducing information by a reproducing probe having a microscopic aperture for producing near-field light, the] An information reproducing apparatus [characterized by] comprising:

an information recording medium having on a read-out track a data region forming data bits for [to be read by the reproducing probe a reproduced-data zone recording] reproduced data and a servo pattern region forming servo bits [zone

recording servo data] for tracking control, the servo [data] bits being arranged with a constant deviation alternately left and right with respect to a center axis of the read-out track;

a reproducing probe for reading the read-out track, the reproducing probe having a microscopic aperture for producing near-field light and for directing the near-field light toward the read-out track during reading of the read-out track so that the near-field light is scattered by the servo bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light by the servo data and for outputting a detection signal;

comparison operating means for comparing [between] a detection signal outputted from the photo-detecting means [and] with a synchronization signal determined [based on] in accordance with an interval of the servo [data] bits and for generating and outputting a differential signal; and

reproducing-probe-position control means for controlling a position of the reproducing probe [according to the] in accordance with a differential signal outputted by the comparison operating means.

8. (Amended) [In an information reproducing apparatus for reproducing information by a reproducing probe

having a microscopic aperture for producing near-field light,
the] An information reproducing apparatus [characterized by]
comprising:

an information recording medium having on a read-out
track a data region forming data bits for [to be read by the
reproducing probe a reproduced-data zone recording] reproduced
data and a servo pattern region forming servo bits [zone
recording servo data] for tracking control, [as] the servo
[data being arranged alternately] bits having a first groove
[formed having a depth increased constantly or gradually in
one] that is deep in a direction perpendicular to both a
[direction] length of the read-out track and a [direction of
a] depth of the information recording medium, and a second
groove [formed having a depth increased constantly or
gradually in the other direction perpendicular to both the
direction of the read-out track and the direction of the depth
of the medium, on the read-out track in the servo pattern
zone] that is deep in a direction opposite to the first groove
and having a depth gradually increasing along the read-out
track;

a reproducing probe for reading the read-out track,
the reproducing probe having a microscopic aperture for
producing near-field light and for directing the near-field
light toward the read-out track during reading of the read-out

track so that the near-field light is scattered by the servo bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light by the servo data and for outputting a detection signal;

comparison operating means for comparing [between] a detection signal outputted from the photo-detecting means [and] with a synchronization signal determined [based on] in accordance with an interval of the servo [data] bits and for generating and outputting a differential signal; and

reproducing-probe-position control means for controlling a position of the reproducing probe [according to the] in accordance with a differential signal outputted by the comparison operating means.

9. (Amended) [In an information reproducing apparatus for reproducing information by a reproducing probe having a microscopic aperture for producing near-field light, the] An information reproducing apparatus [characterized by] comprising:

an information recording medium having on a read-out track a data region forming data bits for [to be read by the reproducing probe a reproduced-data zone recording] reproduced

data and a servo pattern region forming servo bits [zone recording servo data] for tracking control, [as] the servo bits having [data being arranged alternately] a first groove extending in a [formed having an interval in a direction of the read-out track increased constantly or gradually in one] direction perpendicular to both a length [the direction] of the read-out track and a [direction of a] depth of the information recording medium, and a second groove extending in a direction opposite to the first groove; [formed having an interval in the direction of the read-out track increased constantly or gradually in the other direction perpendicular to both the direction of the read-out track and the direction of the depth of the medium, on the read-out track in the servo pattern zone]

a reproducing probe for reading the read-out track,
the reproducing probe having a microscopic aperture for
producing near-field light and for directing the near-field
light toward the read-out track during reading of the read-out
track so that the near-field light is scattered by the servo
bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light by the servo data and for outputting a detection signal;

comparison operating means for comparing [between] a detection signal outputted from the photo-detecting means [and] with a synchronization signal determined [based on] in accordance with an interval of the servo [data] bits and for generating and outputting a differential signal; and

reproducing-probe-position control means for controlling a position of the reproducing probe [according to the] in accordance with a differential signal outputted by the comparison operating means.

10. (Amended) [In an information reproducing apparatus for reproducing information by a reproducing probe having a microscopic aperture for producing near-field light, the] An information reproducing apparatus [characterized by] comprising:

an information recording medium containing [forming] a unit of [the] information [as] comprised of a groove [formed] having a depth which increases constantly or gradually [increased] in [one] a direction perpendicular to both a length [direction] of the [a] read-out track [to be read by the reproducing probe] and a [direction] [of a] depth of the information recording medium;

a reproducing probe for reading the read-out track, the reproducing probe having a microscopic aperture for producing near-field light and for directing the near-field

light toward the read-out track during reading of the read-out track so that the near-field light is scattered by the servo bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light by the servo data and for outputting a detection signal; and

reproducing-probe-position control means for controlling a position of the reproducing probe [according to] in accordance with an intensity of the detection signal outputted by the photo-detecting means.

11. (Amended) [In an information reproducing apparatus for reproducing information by a reproducing probe having a microscopic aperture for producing near-field light, the] An information reproducing apparatus [characterized by] comprising:

an information recording medium having a groove containing a unit of information, the groove being saw tooth-shaped in a section taken in a direction perpendicular to a read-out direction, [to be read by the reproducing probe is formed in the form of saw tooth,] the unit of information being formed along a slant surface of the saw tooth-shaped groove; [constituting the saw tooth]

a reproducing probe for reading the read-out track,
the reproducing probe having a microscopic aperture for
producing near-field light and for directing the near-field
light toward the read-out track during reading of the read-out
track so that the near-field light is scattered by the servo
bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection
scattering light [caused due to] generated as a result of the
scattering of the near-field light by the servo data and for
outputting a detection signal; and

reproducing-probe-position control means for
controlling a position of the reproducing probe [according to]
in accordance with an intensity of the detection signal
outputted by the photo-detecting means.

12. (Amended) [In an information reproducing
apparatus for reproducing information by a reproducing probe
having a microscopic aperture for producing near-field light,
the] An information reproducing apparatus [characterized by]
comprising:

an information recording medium having [forming the
information on] a read-out track containing information [to be
read by the reproducing probe];

a reproducing probe for reading the read-out track
of the information recording medium, the reproducing probe

having microscopic apertures for producing near-field light and for directing the near-field light toward the read-out track during reading of the read-out track so that the near-field light is scattered by the information contained in the read-out track, the microscopic apertures extending at an [formed having a] interval in a [direction of the read-out track increased constantly or gradually in one] direction perpendicular to both a direction of the read-out track and a direction of a depth of the information recording medium;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light [(produced at the microscopic aperture)] by the information contained in the read-out track and for outputting a detection signal; and

reproducing-probe-position control means for controlling a position of the reproducing probe [according to] in accordance with an intensity of the detection signal outputted by the photo-detecting means.

13. (Amended) [In an information recording medium for recording/reproducing information at a medium surface by a probe having a microscopic aperture for producing near-field light, the] An information recording medium comprising: [characterized in that:] a read-out track having a data region forming data bits for reproduced [zone recording/reproducing]

data and a servo pattern region forming servo bits [zone recording servo data] for tracking control, [are provided on a track to be recorded/reproduced by the reproducing probe; and as the servo data,] two of the servo bits being [data having a surface form or sectional form] asymmetric in section about a direction of the read-out track and symmetric in section [line-symmetric] about a center axis of the read-out track; and [arranged on the track in the servo pattern zone].

14. (Amended) [In an information recording medium for recording/reproducing information at a medium surface by a probe having a microscopic aperture for producing near-field light, the] An information recording medium comprising: a read-out track having [characterized in that:] a unit of [the] information to be recorded/reproduced by a probe, the unit of information being [has a surface form or sectional form] asymmetric about a direction of the read-out [a] track [to be recorded/reproduced by the probe].

15. (Amended) [In an information recording medium for recording/reproducing information at a medium surface by a probe having a microscopic aperture for producing near-field light, the] An information recording medium comprising: a read-out track having a slant surface and a unit of information formed along the slant surface, the read-out track

being asymmetric about an axis extending [characterized in that: a section] in a direction generally perpendicular to a scanning direction of a probe for recording/reproducing the unit of information of the read-out track [to be recorded/reproduced by the probe is formed by a track asymmetric about the scanning direction, the information being formed along a slant surface constituting the track].

16. (Amended) [In an information recording/reproducing apparatus for recording/reproducing information by a probe having a microscopic aperture for producing near-field light, the] An information recording/reproducing apparatus [characterized by] comprising:

an information recording medium according to claim 13; [as claimed in any one of claims 13 to 15;]

a probe for recording/reproducing the data and servo bits in the data and servo pattern regions of the read-out track of the information recording medium, the probe having a microscopic aperture for producing near-field light and for directing the near-field light toward the read-out track so that the near-field light is scattered by the servo bits formed in the servo region of the read-out track;

photo-detecting means for detecting reflection scattering light [caused due to] generated as a result of the scattering of the near-field light and for outputting a detection signal; and

probe-position control means for controlling a position of the probe in accordance with [according to] an intensity of the detection signal or a differential signal between the detection signal and a reference signal [as a reference].

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